

STUDENT SUCCESS AND TALENT

Elective Work-Based Learning, Persistence, and Completion in Kentucky Public Higher Education

COUNCIL ON POSTSECONDARY EDUCATION

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The Council on Postsecondary Education is Kentucky's higher education coordinating board overseeing state public universities and the Kentucky Community and Technical College System. The Council also licenses non-profit and for-profit higher education institutions to operate in the Commonwealth. The Council facilitates a positive return on investment of public funds by monitoring academic quality, affordability, and student success through policy and accountability measures.

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From the President



Kentucky's economic future depends on students who earn a credential and graduates who are ready to lead in the workforce. Our 60x30 goal calls for 60% of working-age adults to hold a postsecondary credential by 2030, and with educational attainment now at 55.5%, we are closing in. Reaching this goal means helping every student finish what they start, ready for the career that follows.

That is why this report matters. For years, we have believed that internships, co-ops, and practica help students stay in school. Our Strategic Agenda calls for making work-based learning the rule rather than the exception. Yet until now, Kentucky had no statewide measure of who takes part in work-based learning or how they fare. This study changes that. Drawing on records for more than 327,000 students across every public university and KCTCS college, it gives us our first statewide baseline.

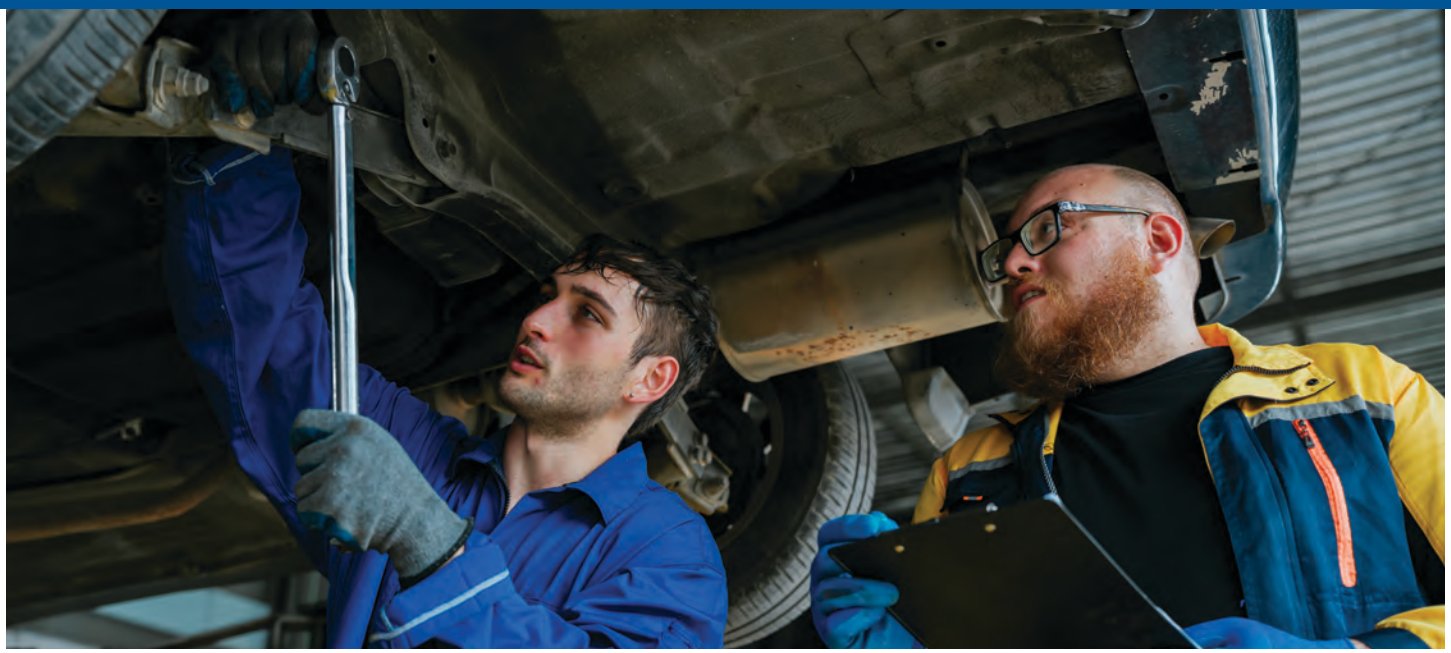
The findings are encouraging. **Students who take an elective work-based learning course are less likely to leave college and more likely to complete a credential, and the advantage is largest when they take the course early, as freshmen or sophomores.** The pattern holds for Pell recipients and first-generation students, who see completion rates roughly double when they participate early.

The report is also honest about its limits. It describes associations, not proof of cause, and it shows that many students never take advantage of these opportunities. **University students typically start their junior year, and part-time, low-income, and first-generation students participate least.**

The recommendations that follow offer a clear path: a new statewide measure and goal for work-based learning participation, more paid internships and earlier placements, stronger employer partnerships, and the support students need to complete the experience. This work is a companion to our *Work-Based Learning in Kentucky: Policy and Practice Blueprint*, and a forthcoming study will examine workforce outcomes.

Sincerely,

Aaron Thompson, Ph.D.
President, Kentucky Council on Postsecondary Education



EXECUTIVE SUMMARY

Work-Based Learning Contributes to Student Success

Bottom line: Students who take an elective, credit-bearing internship, co-op, or practicum are more likely to stay enrolled and complete a credential than comparable Kentucky students who don't participate, especially when they start in their first or second year of college. These experiences belong in Kentucky's strategy for reaching its 60x30 attainment goal.

What the Study Examined

The analysis tracks 327,227 first-time students age 24 or younger who entered a Kentucky public university or KCTCS college from fall 2010 through fall 2021, comparing work-based learning participants with peers at the same stage who had not participated. Required placements like student teaching or healthcare practica are excluded.

What the Study Found

Stop-out risk is lower among work-based learning participants. The adjusted per-term risk of leaving is 6.2% for participants versus 10.4% for non-participants at KCTCS, and 3.1% versus 4.6% at universities.

Early work-based learning experiences are associated with larger persistence gains. Students who start in their first semester or at the start of their second year, when stop-out risk is highest, are about 16

percentage points more likely to stay enrolled through the next year than comparable KCTCS students who have not yet started, and about 9 percentage points more likely at universities.

Completion is higher among work-based learning participants, but a simple comparison overstates the gap. Within 150% of normal program time, 57.6% of KCTCS participants completed a credential, compared to 20.5% of non-participants. At universities, the rates were 83.6% for participants and 40.1% for non-participants. Many students leave before they ever reach a course and count as non-participants by default. Compared at the same point, the advantage is smaller and varies by sector and timing.

The pattern holds for the students who participate least. Adjusted completion roughly doubles for Pell recipients (24.4% versus 49.4%) and first-generation students (24.9% versus 51.2%) who participate early in their programs.

The advantage is concentrated among students who pass. Students who take a work-based learning course but do not pass are more likely to leave than students who have not yet participated.

What This Means for Kentucky

Kentucky should add a statewide measure of elective work-based learning participation, set a statewide goal with public institutions, and pair these experiences with support to help students finish on time. Expanding participation will require addressing supply (only 7.3% of KCTCS entrants take a KCTCS-delivered course), timing (university participants typically start in the junior year), and access (participation is lowest among part-time, low-income, and first-generation students).

Key Facts

- ***Study Population**: 327,227 first-time students (age 24 or younger) tracked, fall 2010 to fall 2021.*
- ***Stop-Out Risk**: Per-term risk of leaving is 6.2% for participants vs. 10.4% for non-participants at KCTCS, and 3.1% vs. 4.6% at universities.*
- ***Persistence**: Students who start early are about 16 percentage points more likely to stay enrolled through the next year at KCTCS, and about 9 percentage points more likely at universities.*
- ***Completion**: Adjusted completion roughly doubles for Pell and first-generation students who participate early.*
- ***Passing the Experience**: Completion is 59.6% for students who pass vs. 35.1% for those who don't at KCTCS, and 86.2% vs. 50.6% at universities.*
- ***Supply**: Only 7.3% of KCTCS entrants take a KCTCS-delivered course.*
- ***Access**: Part-time university students participate at 14.7%, compared with 43.0% of everyone else.*



BACKGROUND

The Importance of Work-Based Learning Throughout Postsecondary Education

Work-based learning has become a national priority. States are working to expand it and to track it: Ohio will require colleges and universities to report participation beginning in 2027-28, Virginia aims to widen access to paid internships, and the State University of New York has set a goal that every undergraduate complete a paid internship or other experiential learning before graduating.[1] National foundations now benchmark states on student access to paid work-based learning.[2] The interest rests on a simple idea: Experiences that connect classroom learning to real work may boost college completion and better prepare students for the jobs that follow.

Kentucky's 60x30 goal calls for 60% of working-age adults to hold a postsecondary degree or credential by 2030. **The state's attainment rate reached 55.5% in 2024, up from 50.3% in 2017**,[3] and further progress depends on more students finishing what they start. Kentucky also needs graduates who arrive at work ready to apply what they learned.

Work-based learning, a pedagogic strategy that provides students with opportunities to apply their curricular learning in real-life settings with employers, sits where those priorities meet.[4] Internships, cooperative education, practica, field experiences, and apprenticeships are widely endorsed for the skills they build,[5] and they are also believed to help students stay enrolled. If that second claim proves true, one investment does two jobs: It raises attainment while producing graduates who have already put their learning to use.

What Counts as Work-Based Learning?



The most common types of work-based learning are:

- **Internship**: A position with an employer, held alongside a degree program, with tasks similar to entry-level work.
- **Cooperative education (co-op)**: Periods of classroom study that alternate with paid professional work, often lasting three to six months.
- **Practicum or field experience**: Supervised practice in a professional setting, common in education, healthcare, and social work.
- **Apprenticeship**: A paid job that combines on-the-job training with classroom learning under an experienced mentor.

This study counts elective, credit-bearing courses that students choose to take and choose when to take. Required placements, such as student teaching or clinical rotations in healthcare programs, are excluded.[6]

These experiences are already part of college in Kentucky. **More than four in ten students who begin at a public university take at least one elective work-based learning course**. Yet systematic evaluation of work-based learning is uncommon in higher education.[7] The evidence that it boosts college completion comes mostly from single campuses or student surveys, and few studies can tell whether the experience itself makes the difference or whether the students who choose it were already more likely to finish.

National research is encouraging. A 2026 systematic review found "promising evidence" that work-based learning can improve learner outcomes, with the clearest gains in academic progress and for internship-based programs.[8] Engineering students who completed more co-op placements were more likely to stay at their university and in their major,[9] and low-income students in Washington State who took internships were more likely to graduate than similar students without internships.[10] Researchers point to several reasons these experiences may help: They show students how coursework connects to a career, build confidence and career clarity, and connect students with mentors and professionals in their field.[11]

These experiences also matter after college. Among a national cohort of 2016 bachelor's recipients, paid internships were associated with about $3,100 more in annual wages one year after graduation,

while unpaid internships showed no significant wage gain.[12] A national study of bachelor's graduates found that 52% were underemployed, working in jobs that did not require a degree, one year after graduating, and that graduates who had completed an internship were 48.5% less likely to be underemployed.[13] Employers notice. In a national survey of executives and hiring managers, 49% said they were much more likely, and another 41% somewhat more likely, to consider a candidate who had completed an internship or apprenticeship.[14]



Access, however, is uneven. Nationally, only 43% of students at public four-year institutions report at least one paid internship, apprenticeship, co-op, practicum, or research experience, compared with 17% at two-year colleges.[15] **In Kentucky, 42% of graduating seniors at four-year institutions report a paid experience**.[16] Between a third and more than half of internships are unpaid,[17] and for a student who must work to stay enrolled, an unpaid, credit-bearing placement means giving up wages while paying tuition. Low-income and first-generation students, along with students at less-resourced institutions, are less likely to have a paid experience, and in one survey, the most common reasons students gave for not taking an internship were a current job, a heavy course load, and too few opportunities in their field.[18]

Kentucky has made work-based learning a priority. The Kentucky Council on Postsecondary Education's (CPE) 2022-2030 Strategic Agenda calls for making "internships, apprenticeships, service and other forms of work-based learning the rule rather than the exception."[19] Yet no statewide measure tracks participation, and most institutions told CPE they do not formally track it at the institutional level.[20] Kentucky is not alone. Strada Education Foundation has urged states to measure participation and access at both the institutional and state levels.[21] This study supplies the first statewide baseline from student course records, which follow every student at every public institution.

CPE is approaching the question in two parts, and this paper is the first. It is a companion to CPE's Work-Based Learning in Kentucky: Policy and Practice Blueprint, which describes what Kentucky campuses offer and lays out a statewide plan for expanding quality work-based learning.[22] This paper adds evidence from student records on who takes part, when they start, and how they fare afterward. **It uses statewide records for 327,227 first-time undergraduates to answer a simple question: Do students who take an elective internship, co-op, or practicum stay enrolled and finish at higher rates than comparable students who have not participated?** The second part, a forthcoming analysis of workforce outcomes and wages, will ask whether these experiences are associated with higher employment rates and earnings after college.

Data and Methods

This study examines who takes elective work-based learning and whether participants are more likely to stay enrolled and complete a credential. It uses student-level records from the Kentucky Postsecondary Education Data System (KPEDS), which follows students over time and across institutions. That lets the study track work-based learning, persistence, and completion across Kentucky's public system rather than at a single campus. A student who transfers and keeps going counts as persisting rather than as a dropout.

The study follows first-time, degree-seeking undergraduates who entered a Kentucky public institution between fall 2010 and fall 2021 at age 24 or younger. Limiting the study to traditional-age students keeps the focus on students who typically begin college soon after high school. Older first-time students more often enroll while working or attending part time, and their reasons for taking a work-based learning course may differ. Only students who entered in a fall term are included. Each student is counted once, and the final sample includes 118,483 students who began at KCTCS colleges and 208,744 who began at four-year universities. Results are reported separately for the two sectors, which serve different students and run on different program timelines.[23]

Identifying Elective Work-Based Learning

Participation was identified from a statewide inventory of work-based learning courses built for this study. Course titles in KPEDS are often abbreviated or unclear: A title containing "INT," for example, could refer to an internship, an introductory course, or an international one. CPE used generative AI to read institutional catalog descriptions and flag courses involving an internship, co-op, practicum, or similar experience, and three CPE data staff then reviewed every entry for accuracy and consistency. The result is a list of 3,258 courses across Kentucky's eight public universities and KCTCS, 2,356 of them elective courses and 902 curricular courses. The inventory can be refreshed as catalogs change, but a standard course flag, as recommended later in this report, would make the process simpler and more reliable.[24]

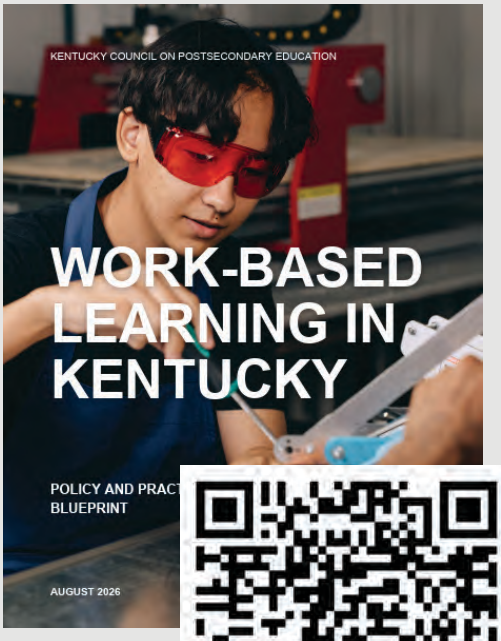
The study counts only elective experiences, which students choose to take and choose when to take. Required placements such as student teaching and clinical rotations are excluded, because every student in those programs must complete them, so there is no comparable group of students who declined. Students who took a required placement remain in the study and count as participants only if they also took an elective course.[25]

This definition is narrower than the one in CPE's blueprint, which counts any experience that intentionally integrates learning and work. Credit-bearing elective courses are the part of that range that statewide records can identify consistently.[26]

How the Study Compares Students

A simple comparison of participants and non-participants can mislead. Many students leave college in their first terms, before they would ever reach a work-based learning course, so they end up in the non-participant group by default. To avoid that bias, the study compares participants with students who were still enrolled at the same point in their education and had not yet participated in work-based learning. Results described as adjusted account for differences in student characteristics and academic progress, so they compare students who are otherwise similar on those measures. A stricter version pairs each participant with similar students at the same stage. The results describe statistically significant associations, but not absolute proof that work-based learning causes better outcomes.[27]

The study also looks at when students participate. For a full-time student, early means roughly the first semester at KCTCS or the first year at a university, middle means roughly the second semester or second year, and later means after the halfway point of the program. Completion is measured within 150% of normal program time, which is three years for an associate degree and six for a bachelor's degree.[28]



Learn about Kentucky's Work-Based Learning Blueprint

Explore Kentucky's approach to strengthening work-based learning in *Work-Based Learning in Kentucky: Policy and Practice Blueprint*. This report offers insights into the policies, practices and partnerships that can help connect students' educational experiences with real-world career opportunities. By examining opportunities to strengthen work-based learning across the state, the blueprint provides a resource for educators, policymakers and employers working to better align education and workforce needs and prepare students for success beyond the classroom.



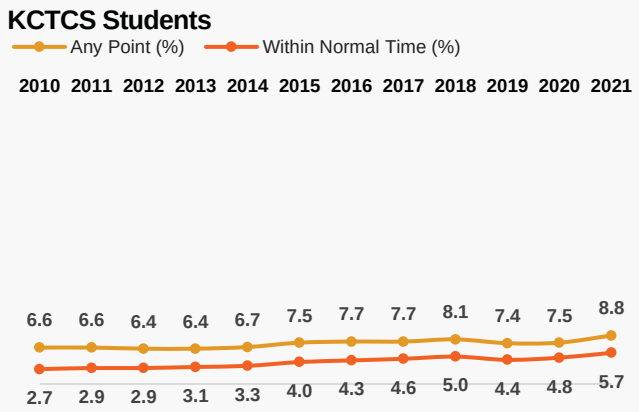
RESULTS

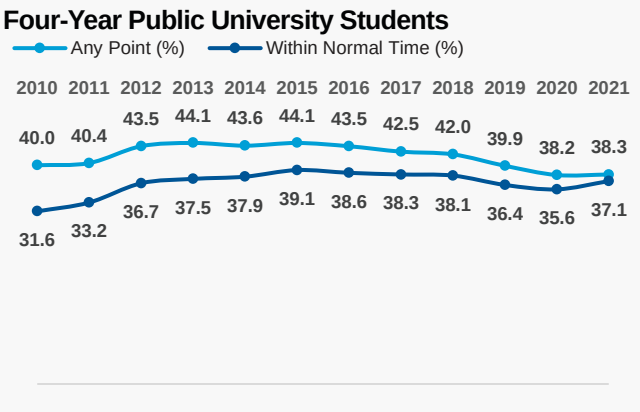
Who Participates in Elective Work-Based Learning

Participation rates depend on how long a student has been observed, so the main measure counts participation within normal program time (two years at KCTCS and four at a university). Figure 1 counts only courses delivered by an institution in the student's starting sector (KCTCS or a university) because many KCTCS students take a work-based learning course only after transferring.

At KCTCS, what changed over twelve cohorts is not how many students eventually took a work-based learning course, but how early they did so. **The share of a KCTCS entering class who took a KCTCS-delivered elective course at any point moved only from 6.6% to 8.8%, while the share reaching a work-based learning course within normal program time more than doubled, from 2.7% to 5.7%** (Figure 1). Both figures are low, partly because of what most KCTCS students are enrolled in. Many are in transfer-oriented general studies programs, where elective work-based learning is rare, as discussed later. University students followed a different path. Participation within normal time climbed from 31.6% to a peak of 39.1% among 2015 entrants, slipped to 35.6% by 2020, and partly recovered in 2021. The 2020 and 2021 entering classes began college during the COVID-19 pandemic, when many placements were disrupted, but the university decline began several years earlier.

Figure 1 | Participation in Elective Work-Based Learning Delivered within the Entering Sector, by Cohort





Source: Kentucky Postsecondary Education Data System (KPEDS).

Participation is uneven across student groups (Table 1). **Within each sector, Pell recipients, first-generation students, and part-time students all participate less often than their classmates**. Enrollment intensity produces by far the largest gap. At universities, 14.7% of part-time students participated, compared with 43.0% of everyone else, a difference of 28.3 percentage points. The Pell gap is 5.1 percentage points at KCTCS and 9.3 percentage points at universities, and the first-generation gap is smaller in both sectors. Women participate more often than men at universities and slightly less often at KCTCS. These are raw differences that do not account for program mix or institution. This study cannot observe whether students were working while enrolled, but as noted earlier, a current job is the most common reason students give for not taking an internship.

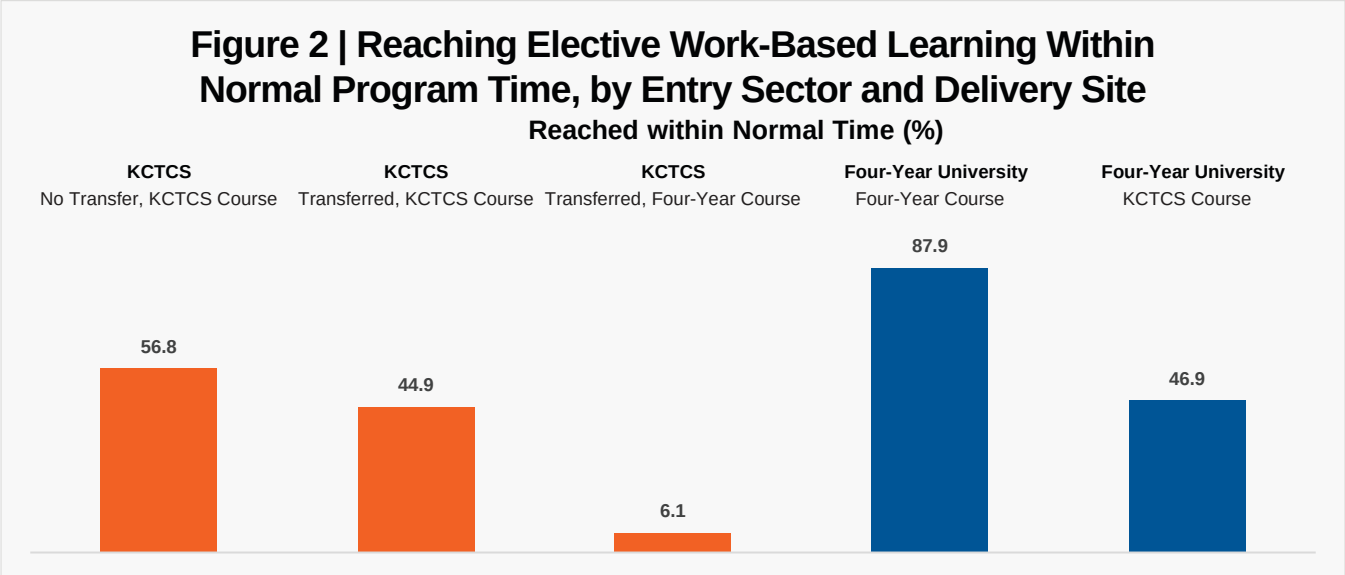
Table 1 | Elective Work-Based Learning Participation Gaps by Student Group and Sector

Student Group	KCTCS Rate	KCTCS Gap	Four-Year Rate	Four-Year Gap
Pell Recipients	11.5%	-5.1 pts	36.6%	-9.3 pts
First-Generation Students	11.4%	-3.7 pts	37.4%	-6.8 pts
Part-Time Students	6.9%	-9.3 pts	14.7%	-28.3 pts
Female Students	12.3%	-2.8 pts	45.7%	+7.6 pts

Note: Rates count elective participation at any institution at any point observed. Gaps are percentage-point differences from all other students in the same sector and are not adjusted for program or institutional mix.
Source: CPE analysis of Kentucky Postsecondary Education Data System (KPEDS) records for first-time, degree-seeking undergraduates age 24 or younger who entered in fall 2010 through fall 2021.

Where a course is delivered also matters. Nearly half (46.5%) of the 16,058 KCTCS entrants who took an elective work-based learning course took it at a four-year institution after transferring, a median of eleven terms after entry. That late timing reflects transfer, not community college practice.[29]

Figure 2 | Reaching Elective Work-Based Learning Within Normal Program Time, by Entry Sector and Delivery Site



Source: Kentucky Postsecondary Education Data System (KPEDS).

KCTCS entrants who never transferred reached a KCTCS-delivered work-based learning course in their fourth term at a median of 45 credits, and 56.8% got there within the normal program time (Figure 2), roughly where a two-year program would place such an experience. Counting only courses that KCTCS colleges deliver, the KCTCS participation rate is closer to 7% than to 14%.

University entrants took their work-based learning courses at a four-year institution 98.5% of the time, at a median of six terms and 64 credits, and 87.9% of them reached a course within normal program time. The other 1.5% took a course delivered by a KCTCS college, a median of twelve terms after entry.

As noted earlier, the low KCTCS figures say less about community colleges than about what most KCTCS students are enrolled in (Table 2). The largest single program area is liberal arts and general studies, which accounts for 50,275 students, or 42.4% of the traditional-age KCTCS sample. Those students are largely enrolled to complete general education credits and transfer, and only 1.8% of them take an elective work-based learning course within normal program time. Health professions, the second largest area at 15,921 students, sits at 1.6%. Between them those two fields account for 56% of KCTCS entrants.

The trades and technical programs look much different. Precision production reaches 29.3% within normal program time, mechanic and repair technologies 23.8%, construction trades 11.8%, and agriculture 49.4%. **Weighted together with engineering technologies and culinary and personal services, these trades and technical fields reach 18.9%, more than ten times the liberal arts figure**. Work-based learning is a routine part of those programs, and it appears in this study because

those colleges list it as an elective course. The elective measure also misses work-based learning built into the required curriculum of many trades programs, particularly short-term workforce certificates, so the share of trades students with an applied experience is likely higher.



Health professions and education are different cases. Clinical placements and student teaching are required in those programs, so this study treats them as curricular and excludes them. Neither field should be read as offering little applied learning.

The field pattern has two implications. First, the statewide KCTCS participation rate is largely a composition figure: Setting liberal arts and general studies aside raises participation within normal program time from 4.5% to 7.0%. Second, the policy question differs across the sector. In trades and technical programs, where these experiences already exist, the question is whether students can reach them earlier. For the transfer-oriented general studies population, the largest group in the sector, the question is whether elective experiences can be made available earlier, particularly as students are contemplating transfer into a more specialized four-year major.

Table 2 | Elective Work-Based Learning Participation by Field of Study, KCTCS Entrants

Field of Study (2-Digit CIP)	Students	Share of Sector	Any Point	Within Normal Time
Liberal Arts and General Studies	50,275	42.4%	12.4%	1.8%
Health Professions	15,921	13.4%	10.5%	1.6%
Business and Management	7,193	6.1%	9.6%	1.7%
Mechanic and Repair Technologies	6,411	5.4%	28.3%	23.8%
Homeland Security and Law Enforcement	5,234	4.4%	7.4%	2.0%
Computer and Information Sciences	4,370	3.7%	7.4%	1.4%
Engineering Technologies	2,875	2.4%	14.5%	5.9%
Education	2,690	2.3%	13.5%	0.8%
Precision Production	2,375	2.0%	36.8%	29.3%
Construction Trades	2,137	1.8%	16.2%	11.8%
Culinary and Personal Services	1,735	1.5%	14.2%	8.2%
Agriculture	474	0.4%	54.6%	49.4%

Note: Fields are two-digit CIP codes. Share of sector is the field's share of KCTCS entrants. Participation columns count elective courses taken at any institution, and normal time is two years.
Source: CPE analysis of Kentucky Postsecondary Education Data System (KPEDS) records for first-time, degree-seeking undergraduates age 24 or younger who entered in fall 2010 through fall 2021.

Findings on Persistence and Completion

Results follow the student pathway. The examination begins with whether work-based learning students stay enrolled from one term to the next. Then, it examines their fall-to-fall and spring-to-fall persistence rates. Finally, it asks whether the pattern carries through to completion.

Work-Based Learning Is Associated with a Lower Risk of Leaving

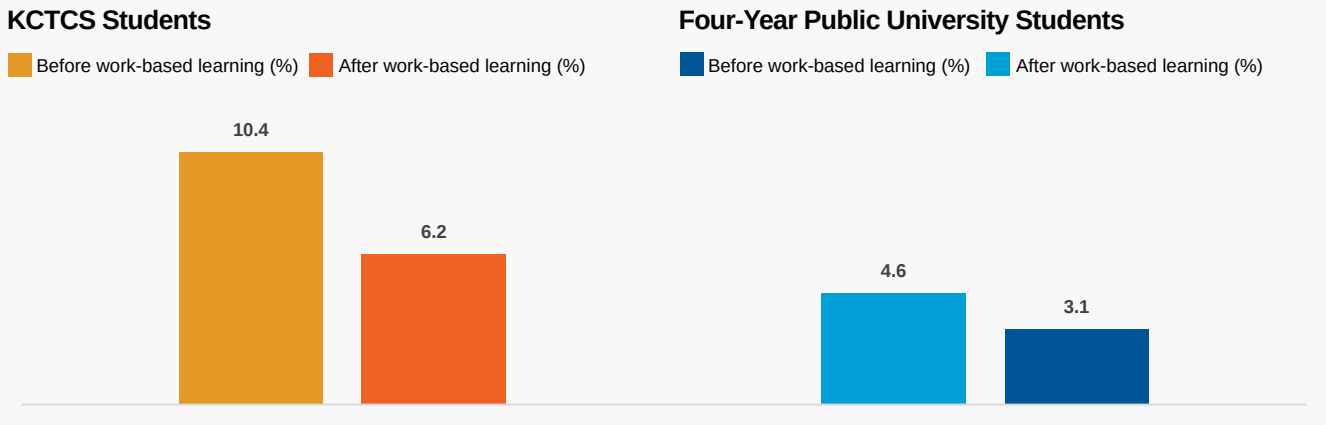
In any given term, students who have already taken an elective work-based learning course are less likely to leave college than students who are still enrolled and have not yet participated: 6.2% versus 10.4% at KCTCS and 3.1% versus 4.6% at universities (Figure 3). **Put plainly, for every 100 KCTCS students enrolled in a given term, about 6 who have participated leave, compared with about 10 who have not**. The difference is larger at KCTCS, where the risk of leaving is higher, and it holds in both sectors.

The Pattern Appears at Key Enrollment Milestones

The next analyses focus on two familiar transitions: whether a fall enrollee returns the following fall and whether a spring enrollee returns after summer. Figures 4 and 5 show the observed rates, and the differences below are adjusted.

After adjustment, prior elective work-based learning remains associated with higher fall-to-fall persistence in every sector and year examined. At KCTCS, the difference ranges from 4.4 percentage

Figure 3 | Adjusted Per-Term Dropout Likelihood, Before and After Work-Based Learning

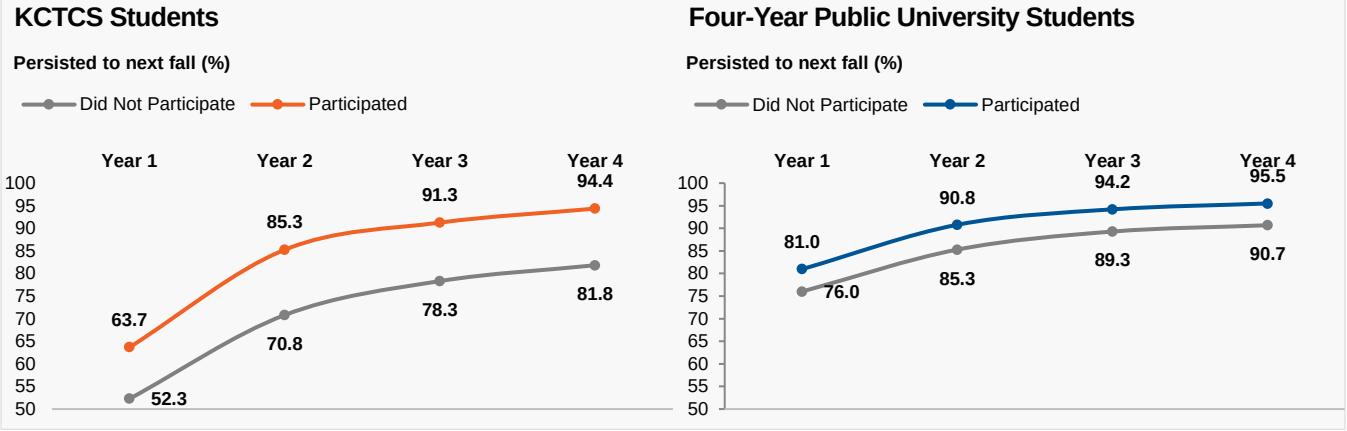


Source: Kentucky Postsecondary Education Data System (KPEDS).

points in year one to 11.9 percentage points in year four. At universities, it remains comparatively stable, ranging from 5.2 to 5.9 percentage points.

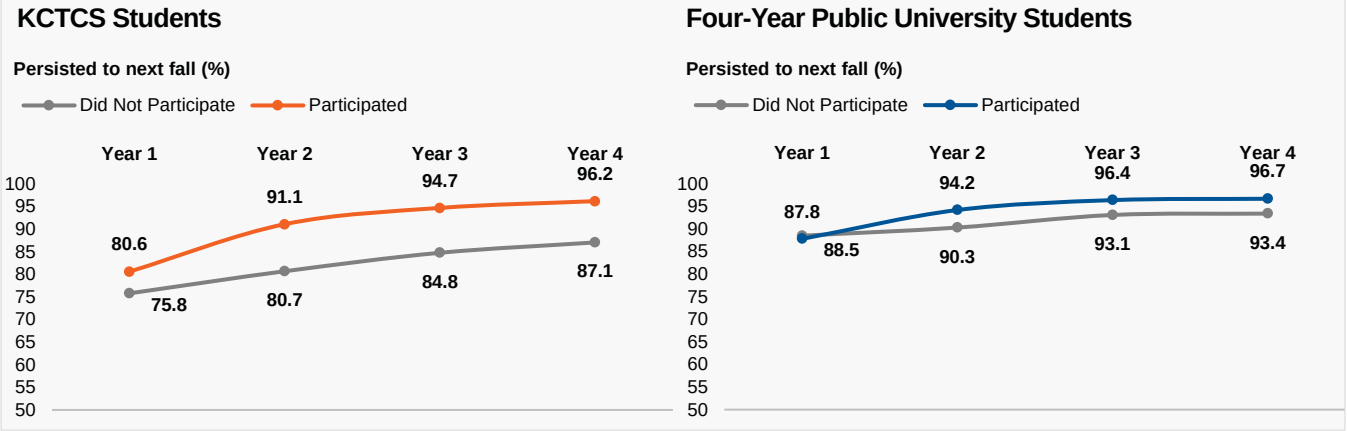
Spring-to-fall results are similar but not uniform. Among KCTCS students, the adjusted difference ranges from 8.0 to 9.2 percentage points from year two onward, but there is no clear difference in the first year. At universities, there is likewise no clear first-year difference, and from year two onward the difference ranges from 3.6 to 4.4 percentage points.[30]

Figure 4 | Fall-to-Fall Persistence by Year of Enrollment, Sector, and Prior Elective Work-Based Learning



Source: Kentucky Postsecondary Education Data System (KPEDS).

Figure 5 | Spring-to-Fall Persistence by Year of Enrollment, Sector, and Prior Elective Work-Based Learning



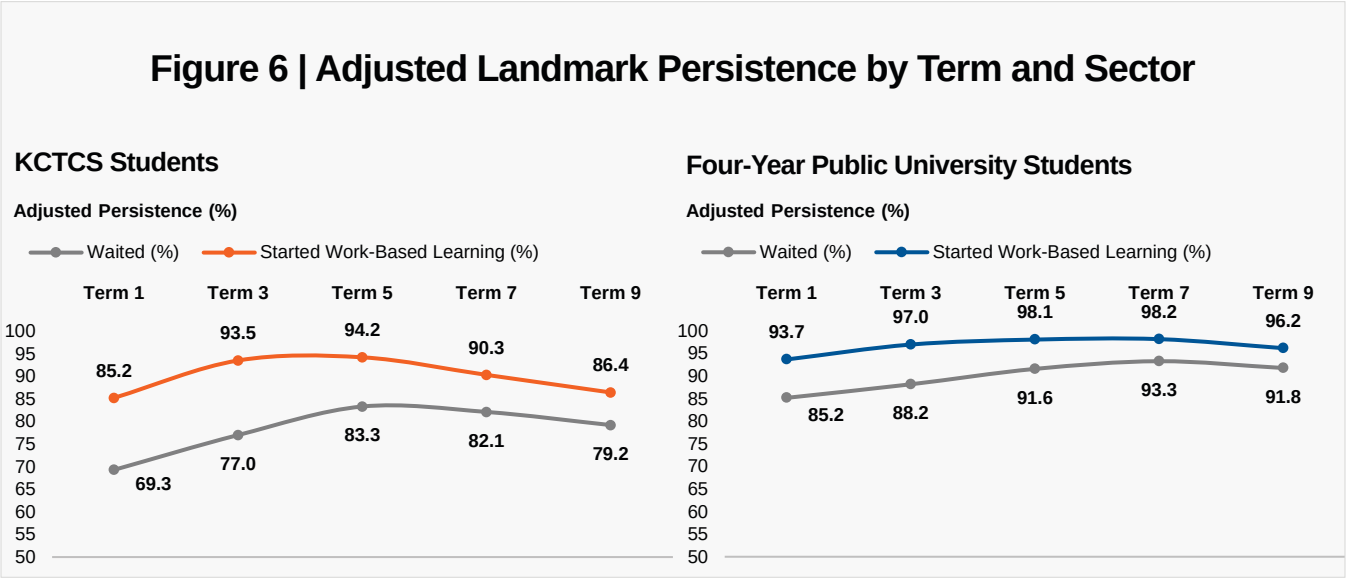
Source: Kentucky Postsecondary Education Data System (KPEDS).

Taken together, the transition results show that the broader persistence pattern survives adjustment, though its size depends on sector and point in the student pathway. The next analysis asks whether it matters when a student starts.

Starting Work-Based Learning Early Is Associated with Stronger Near-Term Persistence

This comparison looks only at students who are still enrolled at the same point and have not yet participated in work-based learning, then compares those who start with those who wait. Figure 6 reports the adjusted chance of staying enrolled for another year.

Figure 6 | Adjusted Landmark Persistence by Term and Sector



Source: Kentucky Postsecondary Education Data System (KPEDS).

Starting elective work-based learning is associated with a higher adjusted chance of staying enrolled at every point in both sectors. **At KCTCS, differences are about 16 percentage points for students who start in their first semester or at the start of their second year and narrow to 7 percentage points by the start of the fifth year**. At universities, they range from about 9 percentage points when courses are taken early to 4 percentage points when taken by start of the fifth year. The largest differences come early, when students are most likely to stop out. The results support offering opportunities well before the end of a program, but they do not identify one best semester.

Selection Explains Part, but Not All, of the Association

A stricter test pairs each participant with similar students who were still enrolled at the same stage and had not yet participated in work-based learning. Adjusted persistence is 96.3% for students who started and 88.5% for matched students who waited, a 7.8-point difference. That is smaller than the 9.9-point difference in the broader comparison, but it remains positive and statistically significant.

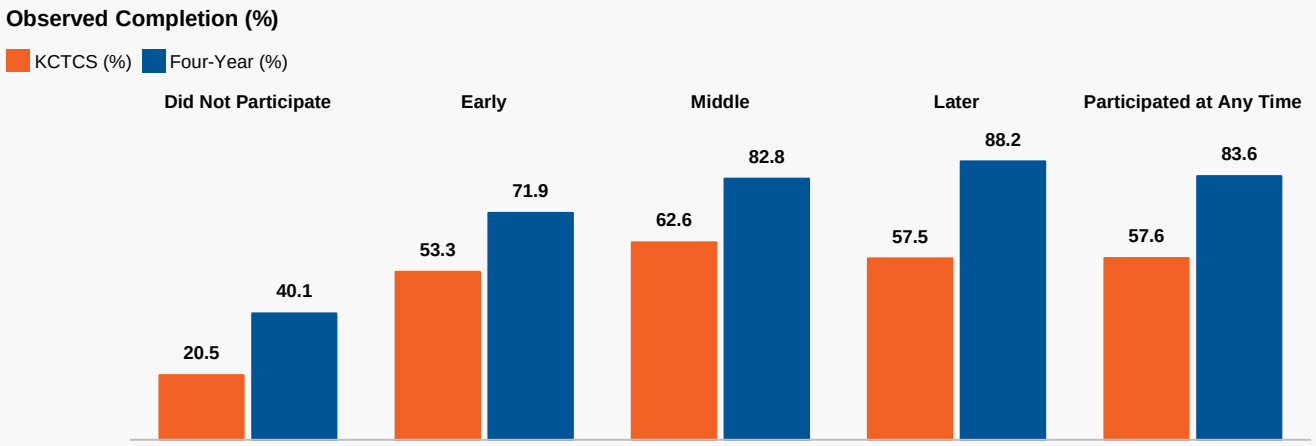
The reduction is itself a finding. Part of the simple gap reflects who chooses these experiences rather than the experiences themselves. Matching can balance only what the data measure, and unmeasured differences in motivation or advising would likely push in the same direction. Therefore, the matched estimate is best read as a ceiling on what elective work-based learning could be contributing, not as a causal effect.

Completion Is Higher Among Participants, but Part of the Gap Reflects Timing

Completion is measured within 150% of normal program time: three years at KCTCS and six at a university. Comparing all participants with all non-participants overstates the difference, because students who left in their first terms never had a chance to participate in work-based learning. When students who were still enrolled at the same point are compared, the advantage is smaller and less consistent across sectors and timing.[31]

Figure 7 reports unadjusted completion within 150% of normal program time. **At KCTCS, 57.6% of work-based learning participants completed, compared with 20.5% of non-participants**. At universities, the corresponding rates were 83.6% versus 40.1%. Completion was higher among early,

Figure 7 | Completion Within 150% of Program Time by Sector and Timing



Source: Kentucky Postsecondary Education Data System (KPEDS).

middle, and later participants in both sectors, but these comparisons include the timing advantage described above, and later participants account for most of it.

After accounting for student differences, completion remains higher for participants at every timing point in both sectors.[32]

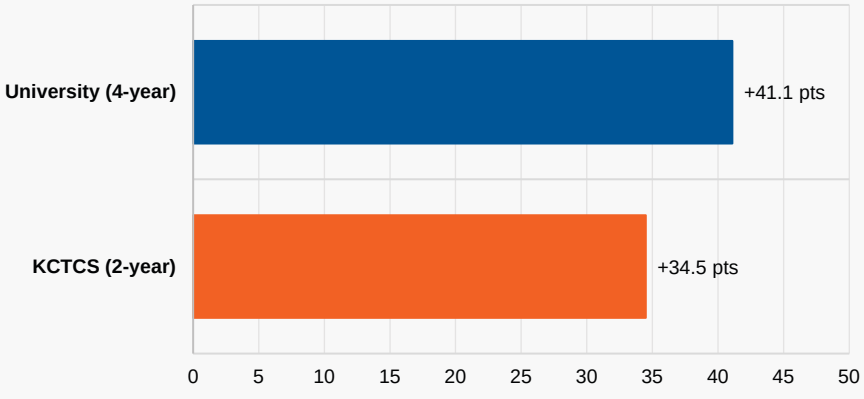
Completion Differences Persist Across Fields of Study



Work-based learning is more common in some disciplines than others, so the study also compares participants and non-participants within broad fields of study, such as nursing with nursing, and business with business. Participants completed at higher rates in every field large enough for comparison: all 19 KCTCS fields and all 29 university fields. Weighted by field size, the average difference was 34.5 percentage points at KCTCS and 41.1 percentage points at universities (Figure 8).

This consistency matters. A positive difference across all 48 comparable fields, covering nearly 250,000 students, cannot be explained solely by work-based learning being concentrated in fields with higher completion rates, although the timing concern applies in every field.

Figure 8 | Field-Adjusted Completion Difference, Holding Field of Study Constant



Source: Kentucky Postsecondary Education Data System (KPEDS).

The Pattern Extends to Pell and First-Generation Students



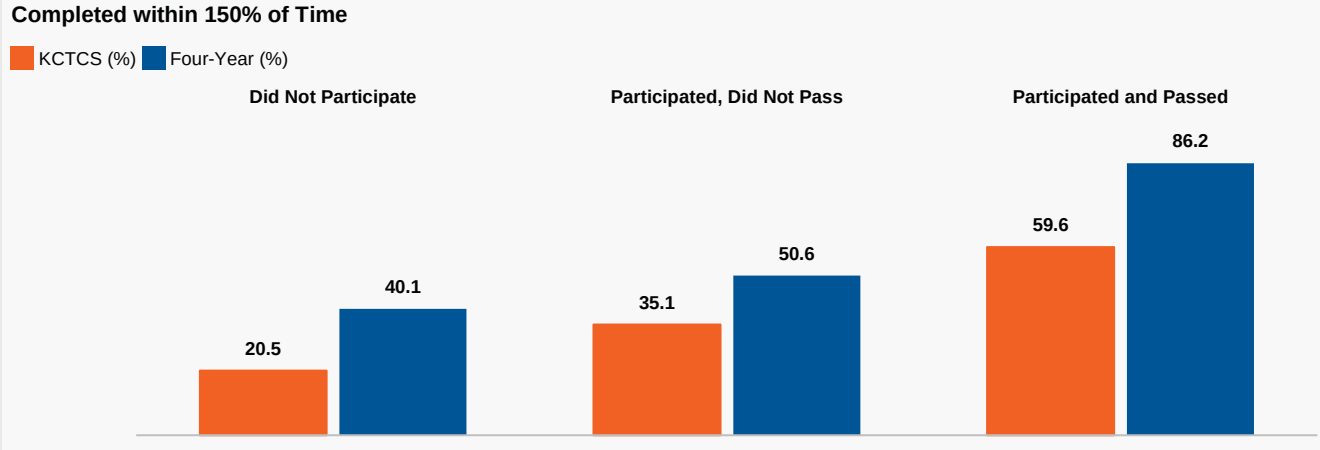
The pattern extends to the students who participate least. Among Pell recipients, adjusted completion within 150% of normal time rises from 24.4% without elective work-based learning to 49.4% for those who participate early. Among first-generation students, it rises from 24.9% to 51.2%. Estimates for later participation are higher but partly reflect time already spent enrolled.[33]

Passing the Experience Matters

Students who passed their first elective work-based learning course account for most of the persistence advantage. Students who took the course but did not pass were more likely to leave than students who had not yet participated.

Completion follows the same order. At KCTCS, 59.6% of students who passed completed within 150% of normal time, compared with 35.1% who attempted but did not pass and 20.5% who never participated. At universities, the corresponding rates were 86.2%, 50.6%, and 40.1% (Figure 9). The pattern remains after adjustment, which suggests that expanding opportunity should go hand in hand with support that helps students complete the experience.

Figure 9 | Completion Within 150% of Program Time by First Work-Based Learning Grade Outcome



Source: Kentucky Postsecondary Education Data System (KPEDS).



POLICY RECOMMENDATIONS

What could help expand access and accountability?

The findings describe associations, so each recommendation pairs expansion with measurement. Together, they aim to make work-based learning a standard part of the path to a credential rather than an extra that some students reach late and others never reach. They build on CPE's blueprint, which calls for a statewide definition of quality work-based learning, a data system to measure and encourage it, and regular convenings of employers and institutions.[34]

- **Adopt a statewide measure and goal for elective work-based learning**. The Strategic Agenda calls for work-based learning to become the rule, but no statewide measure tracks it. CPE should add a key performance indicator: the share of each entering class of first-time, degree-seeking undergraduates who take an elective work-based learning course within normal program time at any Kentucky public institution. The indicator can be updated each year from KPEDS using the course inventory built for this study, and it would give the public dashboard proposed in CPE's blueprint a ready starting point. By this definition, statewide participation rose from 20.9% among fall 2010 entrants to a high of 27.6% among 2015 entrants, dipped to 24.2% in 2019, and stood at 26.1%, about one in four, among 2021 entrants. CPE should work with institutions to set a statewide goal that reflects how many placements campuses and employers can offer. Earlier participation is ideal but should not be required. The indicator should also be reported for Pell, first-generation, and part-time students, along with a companion measure of the share who pass.[35]

- **Standardize how campuses record work-based learning**. This study had to build its course inventory from catalog descriptions, because course titles alone do not reliably identify an internship. CPE's blueprint proposes a common course attribute for work-based learning, with fields for employer type and whether a placement is paid.[36] Adding that attribute to KPEDS course submissions would make the statewide indicator easier to maintain. It would also let future analyses compare paid and unpaid placements, a question this study could not answer.

- **Expand availability at KCTCS, starting with transfer pathways**. Only 7.3% of KCTCS entrants take a course delivered by a KCTCS college, and fewer than 2% of liberal arts and general studies students do so within normal program time. KCTCS and the universities should build an elective, credit-bearing work-based learning option into transfer pathways, with credit that counts toward the bachelor's degree, so the largest group of community college students is not left out. Faculty will need support to build these courses, which CPE's blueprint also calls for through faculty training and statewide convenings. A ten-college consortium in San Diego and Imperial counties offers one model: Nearly 175 of its instructors and staff completed a course on bringing work-based learning into their teaching.[37] KCTCS students who do reach these courses already get there by the fourth term, so the task is availability more than timing.

- **Offer experiences earlier at the universities**. University participants typically start at about 64 credits, past the midpoint of a bachelor's degree, yet the persistence advantage appears at every checkpoint, including the sophomore and junior years. Programs should offer shorter or entry-level experiences earlier, such as project-based placements or course-embedded projects with employers, rather than reserving work-based learning for the final year. Kentucky already has a model. At Eastern Kentucky University, first-year students in ENG 201, Career Development in English, shadow staff or faculty in a campus office, take on a project, and present what they learned to their peers.[38] Nationally, faculty at 25 institutions in the Council of Independent Colleges are redesigning courses around employer projects that students can complete remotely, and Ithaka S+R is comparing their outcomes with those of matched students.[39] The stage-matched completion results are mixed, so timing should fit each program's structure.

- **Build employer capacity field by field**. Participation varies sharply by field. At KCTCS, it is concentrated in trades and technical programs and is rare in business, general studies, and health outside required clinicals. Student interest is not the main constraint: Nationally, an estimated 8.2 million learners sought internships in 2023, but only 44% found one.[40] Colleges, regional employers, and workforce partners should set placement goals for in-demand fields where participation is lowest and share the work of supervision and course design. KCTCS has used a systemwide employer asset map since 2022 to track its employer relationships, and CPE's blueprint proposes a statewide employer asset map and needs assessment.[41] Intermediary

organizations can help small and midsized employers that lack the staff to design and supervise placements. Kentucky already has models: KYFAME students work three days a week at a regional manufacturer and attend classes two days a week toward an associate degree,[42] and registered apprenticeships now enroll more than 714,000 people nationally.[43]

- **Make participation more accessible by offering paid internships**. Unpaid placements are a real barrier for students who must work. CPE's blueprint calls a paid program the gold standard for work-based learning.[44] Institutions and employers should expand paid placements, and the state and its partners could support them through options the blueprint lays out, including tax credits or subsidies for employers, student stipends, and state-matched work-study. Federal Work-Study can also support off-campus jobs related to a student's program, so campuses can use it to pay students in career-related placements. Career offices are part of the answer: Students who report quality career coaching are more likely to have held a paid experience.[45]

- **Help students finish the experience**. The advantage is concentrated among students who pass; students who attempt a course without passing are more likely to leave. Programs should pair placements with advising, clear learning goals, regular check-ins with faculty or employer mentors, and early outreach when a student falls behind. Hazard Community and Technical College offers one model: Trained peer mentors help students with course navigation, tutoring, and career services.[46] Statewide quality standards for credit-bearing placements, covering supervision, meaningful work, and pay, would help make the experience worth finishing. The shared definition of quality work-based learning proposed in CPE's blueprint is the natural place to set them.

- **Design for the students who participate least**. Part-time students participate at less than half the rate of their peers in both sectors, and Pell recipients and first-generation students also participate less often. Flexible formats, such as evening, remote, project-based, or shorter placements, can widen access, as can options that let a student's current job count toward a work-based learning course when it meets the course's learning requirements. Institutions should use the participation gaps reported here to find where scheduling, financial, transportation, and advising barriers are largest. For KCTCS entrants, these gaps include courses delivered after transfer.



Conclusion

Across term-by-term persistence, annual transitions, stage-matched comparisons, completion models, fields of study, and student groups, the evidence points in the same direction: Elective work-based learning is associated with stronger persistence and higher completion. The persistence evidence is strongest, because participation precedes the outcome and students are compared at similar stages. The completion evidence holds but is more modest and more sector-specific once students are compared at the same stage. The study cannot establish causality, yet the consistency across methods supports broader access to high-quality elective work-based learning, paired with support that helps students finish the experience.

CPE's blueprint lays out how Kentucky can expand quality work-based learning, and this study adds the student-level evidence behind that plan. The approach also travels. A recent national review called for stronger linked education and workforce data to evaluate these programs,[47] and the course and enrollment records used here are the kind many state systems already hold. The next step is to learn whether these experiences also pay off in the workforce.

Technical Notes

These notes describe the data, definitions, and methods behind the findings, along with additional results, sensitivity checks, and limitations.

Sample and Definitions

The study follows first-time, degree-seeking undergraduates who entered a Kentucky public institution in a fall term between fall 2010 and fall 2021 at age 24 or younger. Each student is counted once and is classified by the sector of the institution where the student first enrolled, called the starting sector. KCTCS and university students differ in Pell receipt, first-generation status, enrollment intensity, and completion (Table A1), so every result is reported separately by sector. A student counts as persisting if the student later enrolls at any Kentucky postsecondary institution represented in KPEDS or completes a credential. There is no national enrollment match, so out-of-state enrollment and completion are not observed.

Table A1 | Characteristics of the Analytic Sample, by Starting Sector

Group	KCTCS	Four-Year Universities
Students	118,483	208,744
Took Elective Work-Based Learning (Any Institution)	13.6%	42.4%
Course Delivered in the Starting Sector (KCTCS or University)	7.3%	41.8%
Female	54.5%	56.7%
Low-Income (Pell)	60.1%	37.4%
First-Generation	42.7%	26.4%
Enrolled Full-Time	71.8%	97.8%
Completed within 150% of Program Time	25.6%	58.8%

Note: Sector is the starting sector. Participation counts elective courses taken at any Kentucky public institution unless noted.
Source: CPE analysis of Kentucky Postsecondary Education Data System (KPEDS) records for first-time, degree-seeking undergraduates age 24 or younger who entered in fall 2010 through fall 2021.

The course inventory began with the KPEDS course tables, which list every course offered at Kentucky's public institutions, often under abbreviated titles. Institutional catalogs hold full course descriptions but far more of them than staff could review by hand, so generative AI read the descriptions and flagged courses involving an internship, co-op, practicum, or similar experience. Each flagged course was matched to its KPEDS record and coded as elective or curricular, and three CPE data staff divided the coded inventory and reviewed every entry. Elective status is assigned at the course level, so a course that is optional in most programs but required in a few is treated as elective for every student who takes it. Students whose only work-based learning was curricular remain in the study as non-participants.

About 1,300 students had a work-based learning course dated in the spring before their fall entry, which for traditional-age first-time entrants is senior-year dual credit rather than a postsecondary elective experience. Those courses are not counted as participation. The students remain in the sample and are credited from any later qualifying course.

Where Courses Were Delivered

Because KPEDS follows students across institutions, a KCTCS entrant may take an elective course at a university after transferring (Table A2). Of the 16,058 KCTCS entrants who took an elective course at any institution, 46.5% took it at a four-year institution after transferring. Their first participation came a median of eleven calendar terms after entry, at 100 credits, and only 6.1% of them reached a course within normal program time. Of the 13.6% of KCTCS entrants who ever participated, 7.3 percentage points reflect courses delivered by a KCTCS college and 6.3 percentage points reflect courses delivered after transfer.

Counted at any institution, the share of KCTCS entrants who ever participate looks nearly flat across cohorts, moving from 13.8% to 12.9%. That stability hides two series moving in opposite directions: KCTCS-delivered participation rose from 6.6% to 8.8%, while participation after transfer fell from 7.3% to 4.2%, partly because recent entrants have had less time to transfer and reach a course. Part-time enrollment also delays participation, but less than transfer does: Among KCTCS participants, 32.9% of full-time entrants reached a course within normal time, compared with 25.5% of part-time entrants. Transfer also leaves the KCTCS timing groups unevenly sized, with far more students in the later group than the early one.

Table A2 | Where Elective Work-Based Learning Was Delivered, and When Students Reached It

Entry Sector and Delivery Site	Participants	Share of Sector	Median Terms After Entry	Median Credits
KCTCS, No Transfer, Course at KCTCS	6,664	41.5%	4	45
KCTCS, Transferred, Course at KCTCS	1,929	12.0%	6	55
KCTCS, Transferred, Course at Four-Year	7,463	46.5%	11	100
Four-Year Entrant, Course at Four-Year	87,191	98.5%	6	64
Four-Year Entrant, Course at KCTCS	1,327	1.5%	12	78

Note: Share is the percentage of each starting sector's elective participants. Median terms are calendar terms from entry to the first elective course, and median credits are credits earned before it. Two KCTCS entrants who took a course at a four-year institution without transferring are not shown, so the KCTCS rows sum to 16,056 of 16,058 participants.
Source: CPE analysis of Kentucky Postsecondary Education Data System (KPEDS) records for first-time, degree-seeking undergraduates age 24 or younger who entered in fall 2010 through fall 2021.

Analytic Methods

Students choose whether and when to take elective work-based learning, and a student must stay enrolled long enough to reach a course. An unadjusted comparison would therefore credit work-based learning with persistence that happened before it, a problem known in medical research as immortal time bias.[48] A diagnostic check confirmed the concern: Students who eventually participated were already more likely to persist before their first elective course.

The primary persistence analysis is a term-by-term event-history model that compares, in each term, students who have participated with students who remain enrolled but have not yet participated.[49] Adjusted annual-transition models separately examine fall-to-fall and spring-to-fall persistence within sector and year of enrollment. Work-based learning counts only when it occurs by the starting term, and students who complete a credential before the following fall count as persisting.

A sequential landmark analysis provides a second timing check.[50] At enrolled terms 1, 3, 5, 7, and 9, it includes only students who are still enrolled and have not yet participated, then compares those who begin elective work-based learning with those who wait. For a student enrolled each fall and spring, term 3 is the start of the sophomore year and term 5 is the start of the junior year. Models adjust for credits earned as a share of the credential, so participants are compared with students at a similar level of academic progress. A matched risk-set analysis provides a more restrictive comparison, pairing participants with similar still-enrolled students on the same progress measure and other observed characteristics.[51]

Completion is examined within 100% and 150% of normal program time, at any point observed, and through a landmark check that measures completion within six subsequent KPEDS terms. Each analysis includes only cohorts old enough to reach the relevant checkpoint. Timing groups use credits earned before the first elective course as a share of the credits a credential requires (60 for

an associate degree and 120 for a bachelor's degree): Early participation falls in the first quarter of a program (up to 15 credits at KCTCS or 30 at a university), middle participation falls in the second quarter (up to 30 or 60 credits), and later participation comes after the halfway point. Models account for available demographic and enrollment characteristics, results are reported as adjusted probabilities, and sensitivity checks add starting institution, entry cohort, and broad field of study.

Additional Results

Participants also had higher adjusted completion within 100% of normal program time and at any point observed, although the any-observed measure is less comparable because recent cohorts have had less time to finish.

A stricter completion check compares students who are still enrolled and have not yet participated at the same enrolled term, then asks whether those who start complete within the next six terms. At KCTCS, adjusted completion is 31.5% for students who start in the first term versus 18.7% for those who wait, and 36.8% versus 31.4% for students who start in the third term. The fifth-term estimate is lower for starters (29.0% versus 32.3%), and later differences are not statistically significant. At universities, positive differences appear at the fifth term (53.3% versus 49.3%) and the seventh term (77.6% versus 69.5%). Earlier university estimates are near zero because six terms is too short for most bachelor's students to finish.

By timing group, predicted completion within 150% of normal time in the pooled model was 33.5% without elective work-based learning, 60.7% for early participation, 72.2% for middle participation, and 75.1% for later participation. Estimated separately by sector, adjusted completion at KCTCS was 21.0% without work-based learning, 50.7% for early participation, 59.4% for middle participation, and 52.4% for later participation. At universities, the corresponding rates were 41.6%, 70.5%, 81.2%, and 87.1%. Later participants had to stay enrolled longest to reach a course, so their estimates carry the most timing advantage, and the KCTCS decline from middle to later participation may reflect prior-progress selection or differences in the experiences students take later. Among Pell recipients, adjusted completion was 64.4% for middle and 69.0% for later participation; among first-generation students, 65.2% and 69.4%.

Prespecified interaction tests show how the timing of the association varies by group. For Pell recipients, the early-participation advantage is significantly smaller than for other students, while the later-participation advantage is significantly larger. For first-generation students, the early-participation advantage is not measurably different, but the later-participation advantage is again significantly larger. On the persistence side, adjusted landmark models find no statistically significant difference in the relative association by Pell, first-generation, or full-time status.

Sensitivity Checks

Most sensitivity analyses leave the central pattern intact. Adding fixed effects for starting institution, entry cohort, and broad field strengthens rather than weakens the headline estimates. Excluding students whose only work-based learning was curricular changes the persistence estimates very little. Refitting the main models on fall 2010 through fall 2019 entrants, which sets aside students who began college during the pandemic, produces nearly identical completion estimates and a slightly stronger persistence association. Earlier cohorts were also enrolled in 2020 and 2021, so this check does not remove every pandemic-era term. A model of time to completion points in the same direction.

A further check addresses where these experiences were delivered. Refitting the KCTCS comparisons to count only courses delivered by KCTCS colleges leaves the persistence association intact. Adjusted completion within 150% of normal time is 60.5% for students who took a KCTCS-delivered course and 22.7% for those who did not, a larger difference than under the published definition (52.8% versus 21.0%). Where the course was delivered therefore changes how KCTCS participation should be described, but not what the KCTCS results show.

Limitations

Residual selection remains the central limitation. The timing safeguards reduce the most obvious bias, but participants may still differ from non-participants in ways the data cannot measure, including advising, academic momentum, motivation, program expectations, schedule flexibility, and employment while enrolled. Students who work outside jobs may have less time for an elective placement and more pressure to stop out, so outside work could account for part of the gap. The forthcoming workforce analysis, which draws on wage records, could examine work during enrollment, including whether placements tied to a student's program differ from other jobs. The smaller matched estimate confirms that observed selection accounts for part of the primary association. Completion comparisons are the most exposed, because every participant had to stay enrolled long enough to reach a course, and middle and later participants longest of all. The stage-matched completion check addresses this directly, and its smaller, uneven estimates are the more conservative guide.

The six-term completion window used in the stage-matched check is much more restrictive for early university students than for KCTCS students. Participation gaps by Pell, first-generation, and part-time status, institution, and field are descriptive. Adjusted participation models were not estimated, so the analysis cannot determine how much of those gaps would remain after accounting for program and institutional differences. Sector is assigned from the starting institution, while persistence is measured across the public system and a course may be delivered anywhere in it. The KCTCS-only sensitivity analysis narrows this mismatch but cannot remove it.

The exclusion of curricular work-based learning also limits what this study can say. Clinical placements, student teaching, and other required experiences are the ones most closely tied to licensure and entry into a specific occupation, and their value is more likely to appear in employment and earnings than in whether a student returns the following fall. The forthcoming workforce analysis will examine them on those terms.

The findings apply to traditional-age, first-time, fall-entry students who began at Kentucky public institutions. They should not be generalized to adult, nontraditional, spring-entry, or transfer-in students. Because KCTCS serves many students older than 24, the KCTCS results describe traditional-age entrants rather than the full KCTCS student body. Whether older students participate at different rates, or show the same associations, is a question for future work. High school GPA was too incomplete to include, and about 15% of students lacked a detailed field code; those students were excluded only from the within-field analysis. Recent cohorts have not yet had the full completion window. Course records do not show whether a placement was paid, so the study cannot distinguish paid from unpaid, short from intensive, or high- from low-quality placements, even though these experiences vary widely and pay is associated with later earnings.[52] Finally, the study does not follow what students do after participating, such as whether they change majors. KPEDS records could support that analysis, while alignment between a graduate's field and first job is a question for the workforce follow-up.



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16 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky: Policy and Practice Blueprint* (Frankfort: Kentucky Council on Postsecondary Education, 2026), https://cpe.ky.gov/data/reports/2026workbasedlearningblueprint.pdf, citing Strada Education Foundation survey data.

17 Matthew T. Hora, *Unpaid Internships and Inequality: A Review of the Data and Recommendations for Research, Policy and Practice*, CCWT Policy Brief 2 (Madison, WI: Center for Research on College-Workforce Transitions, 2022). Among the class of 2023, 40.8% of internships were unpaid, and Pell recipients and first-generation students were somewhat more likely than their peers to hold unpaid positions: National Association of Colleges and Employers, "The Class of 2023: Inequity Continues to Underpin Internship Participation and Pay Status" (Bethlehem, PA: National Association of Colleges and Employers, 2023), https://www.naceweb.org/diversity-equity-and-inclusion/trends-and-predictions/the-class-of-2023-inequity-continues-to-underpin-internship-participation-and-pay-status.

18 On low-income and first-generation students and institutional resources, see Torpey-Saboe and Amankwah-Ayeh, *Work-Based Learning: Who Gets Paid?*; and Clayton, Torpey-Saboe, and Leigh, *The Power of Work-Based Learning*. On reasons for not taking an internship, see Matthew T. Hora, Zi Chen, Emily Parrott, and Pa Her, "Problematizing College Internships: Exploring Issues with Access, Program Design, and Developmental Outcomes in Three U.S. Colleges," WCER Working Paper 2019-1 (Madison, WI: Wisconsin Center for Education Research, 2019). Nearly two-thirds of students without an internship said they would have liked one; 58% cited a current job, 52% a heavy course load, and 42% too few internships in their field. Demands outside college weigh most heavily on part-time, older, and commuting students: John P. Bean and Barbara S. Metzner, "A Conceptual Model

of Nontraditional Undergraduate Student Attrition," *Review of Educational Research* 55, no. 4 (1985): 485–540. Awareness may be another hurdle: Karen Gardiner, "Not Enough Students Know about Work-Based Learning Opportunities," *Higher Ed Dive*, September 3, 2026.

19 Kentucky Council on Postsecondary Education, *Higher Education Matters: A Statewide Strategic Agenda for Kentucky Postsecondary Education, 2022–2030*, rev. June 2025 (Frankfort: Kentucky Council on Postsecondary Education, 2025), https://cpe.ky.gov/ourwork/documents/updated-2022-30strategicagenda.pdf.

20 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky: Policy and Practice Blueprint* (Frankfort: Kentucky Council on Postsecondary Education, 2026), https://cpe.ky.gov/data/reports/2026workbasedlearningblueprint.pdf. Institutions that did track work-based learning captured only course-based internships or co-ops.

21 Amy Wimmer Schwarb, "States Seek Ways to Expand Work-Based Learning and Track It Better," Strada Education Foundation, August 25, 2026, https://www.strada.org/news-insights/states-seek-ways-to-expand-work-based-learning-and-track-it-better. Strada's State Opportunity Index compares states on student-reported participation in paid work-based learning, but a survey cannot follow individual students to persistence and completion.

22 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

23 Characteristics of each sector's students appear in the Technical Notes, Table A1.

24 The Technical Notes describe how the inventory was built and reviewed.

25 Every course counted is an academic course recorded in student course records, so Federal Work-Study and other campus jobs are not included.

26 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*. The blueprint defines work-based learning as an experience in which a student "intentionally integrates learning and work," from job shadowing and service learning to clinicals and undergraduate research.

27 The Technical Notes describe the models, the matched comparison, and the sensitivity checks.

28 The 150% measure follows the standard IPEDS convention: National Center for Education Statistics, "Graduation Rates within 100, 150, and 200 Percent of Normal Program Completion Time at Title IV Institutions" (IPEDS Data Explorer, 2026), https://nces.ed.gov/ipeds/.

29 The Technical Notes, including Table A2, give more detail on where courses were delivered and when students reached them.

30 The adjusted first-year spring-to-fall differences were 1.4 points at KCTCS and -0.6 point at universities, and neither was statistically significant.

31 The Technical Notes report this stricter comparison in detail.

32 Completion estimates by timing group are reported in the Technical Notes.

33 Interaction tests by student group are reported in the Technical Notes.

34 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

35 Statewide figures weight each sector's participation rate by the size of its entering class.

36 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

37 Pistorino, Darche, and Headington, "Work-Based Learning: Creating Real-World Relevance in Education."

38 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

39 Michael Fried, “Understanding the Impact of Work-Based Learning: Ithaka S+R to Evaluate a 25-Institution Pilot Program with the Council of Independent Colleges,” Ithaka S+R, October 10, 2023, https://sr.ithaka.org/blog/understanding-the-impact-of-work-based-learning/.

40 Wimmer Schwarb, “States Seek Ways to Expand Work-Based Learning,” citing a Business-Higher Education Forum report. Strada describes the supply of quality opportunities, not student interest, as the main constraint: Strada Education Foundation, “Work-Based Learning,” accessed October 22, 2026, https://www.strada.org/focus-areas/work-based-learning.

41 Wimmer Schwarb, “States Seek Ways to Expand Work-Based Learning”; Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

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43 Gardiner, “Not Enough Students Know about Work-Based Learning Opportunities.”

44 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

45 Torpey-Saboe and Amankwah-Ayeh, *Work-Based Learning: Who Gets Paid?*

46 Kentucky Council on Postsecondary Education, *Work-Based Learning in Kentucky*.

47 Michaelson et al., *Impacts of Work-Based Learning Programs on Student Outcomes*.

48 Samy Suissa, “Immortal Time Bias in Pharmacoepidemiology,” *American Journal of Epidemiology* 167, no. 4 (2008): 492–499.

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51 Yunfei Paul Li, Kathleen J. Propert, and Paul R. Rosenbaum, “Balanced Risk Set Matching,” *Journal of the American Statistical Association* 96, no. 455 (2001): 870–882.

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